

That which is claimed is:

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5 1. A method for targeting a biologic structure to affect its function characterized by the method which comprises irradiating the biologic structure with acoustic energy having a frequency near or at the resonant frequency of the biologic structure to induce acoustic resonance therein.

2. The method according to claim 1 characterized by further comprising the step of determining an acoustic signature of the biologic structure after being induced into acoustic resonance.

10 3. The method according to claim 1 characterized by further comprising the step of determining an acoustic signature and acousto-EM signature of the biologic structure after the biologic structure is induced into acoustic resonance.

4. The method according to claim 1 characterized by further comprising irradiating the specific biologic structure with electromagnetic energy equivalent to a predetermined acousto-EM signature of the biologic structure in acoustic resonance.

15 5. The method according to claim 1 characterized in that the acoustic energy is applied at a sufficient power intensity to affect functions of the biologic structure.

6. The method according to claim 5 characterized in that the functions are selected from the group consisting of disruption and augmentation.

20 7. A method for targeting a specific biologic structure to affect its function characterized without effecting nearby structures characterized by the steps comprising:

a) determining at least one resonant acoustic frequency of the specific biologic structure; and

25 b) irradiating the biologic structure with acoustic energy having a frequency including the resonant frequency of the biologic structure to induce acoustic resonance therein, the acoustic energy being applied at a power output level sufficient to affect functioning of the biologic structure.

8. The method according to claim 7 characterized in that the functioning of the biologic structure is augmented.

30 9. The method according to claim 7 characterized in that the functioning of the biologic structure is disrupted.

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10 The method according to claim 7 characterized in that the biologic structure is selected from the group consisting of virus, bacteria, fungi, tissue masses, worms, arthropods, plants, animals and bone.

11. A method for specifically targeting a biologic structure and affecting its function by inducing acoustic resonance therein characterized by the steps comprising:

a) applying at least one resonant acoustic frequency of the biologic structure and/or introducing electromagnetic energy equivalent to a predetermined electromagnetic energy pattern of the biologic structure; and

b) applying (a) and/or (b) each at a power intensity level to induce acoustic resonance within the targeted biologic structure and to affect functioning therein.

12. The method according to claim 11 characterized in that the functioning of the biologic structure is augmented.

13. The method according to claim 11 characterized in that the functioning of the biologic structure is disrupted.

14. The method according to claim 11 characterized in that the electromagnetic energy pattern is manifested as a electromagnetic property selected from direct current, alternating current, electric field, magnetic field, and electromagnetic radiation.

15. The method according to claim 14 characterized in that a frequency of the alternating current is applied to the structure.

16. A method for targeting a biologic structure to affect its function characterized by the step which comprises applying electromagnetic energy to the biologic structure to induce acoustic resonance therein and affect its functions.

17. The method according to claim 16 characterized in that the electromagnetic energy is equivalent to an electromagnetic energy pattern of the biologic structure and/or equivalent to at least one resonant acoustic frequency of the structure.

18. The method according to claim 16 characterized in that the electromagnetic energy is applied at a power output level sufficient to affect functioning of the biologic structure, the functioning being augmentation or disruption.

19. The method according to claim 17 characterized by further comprising determining an acousto-EM signature of the biologic structure.

20. The method according to claim 17 characterized by further comprising comparing the

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acousto-EM signature of the biologic structure to a previously determined reference acousto-EM signature.

21. The method according to claim 16 characterized by further comprising determining an acoustic signature of the biologic structure.

5 22. The method according to claim 16 characterized by further comprising comparing the acoustic signature of the biologic structure to a previously determined reference acoustic signature.

23. A method to induce acoustic stimulation of a biologic structure to detect and/or identify the biologic structure characterized by the steps comprising:

10 a) applying to the biologic structure acoustic energy having a non-resonant frequency to stimulate the biologic structure; and

b) receiving electromagnetic energy from the structure after the acoustic energy has interacted with the structure; and

15 c) determining the non-resonant electromagnetic signature of the stimulated biologic structure.

24. A system for inducing acoustic stimulation of a biologic structure to detect and/or identify the biologic structure characterized by comprising:

a) means for applying to the biologic structure acoustic energy having a non-resonant frequency to stimulate the biologic structure; and

20 b) means for receiving electromagnetic energy from the structure after the acoustic energy has interacted with the structure; and

c) means for determining the non-resonant electromagnetic signature of the stimulated biologic structure.

25. A method for detecting and/or identifying an inorganic or biologic structure characterized by the steps comprising:

a) inducing acoustic resonance in the structure; and

b) detecting an acoustic signature of the structure.

26. The method according to claim 25 characterized by further comprising comparing a currently determined acoustic signature with a previously determined acoustic signature of the structure.

27. The method according to claim 25 characterized by further comprising detecting a

resonant acousto-EM signature of the structure by detecting at least one electromagnetic property of energy caused by inducing acoustic resonance in the targeted structure.

28. The method according to claim 25 characterized in that acoustic resonance is induce with the introduction of energy selected from the group consisting of acoustic energy including at least one resonant acoustic frequency of the structure, electromagnetic energy equivalent to at least one resonant acoustic frequency of the structure and electromagnetic energy equivalent to at least one acousto-EM signature of the structure.

29. A system for identifying a structure by determining the resonant acoustic signature of the structure characterized by comprising:

- 10 a) means for inducing acoustic resonance in the structure;
- b) means for detecting the acoustic signature of the structure; and
- c) means for comparing the acoustic signature of the structure with a reference acoustic signature of the structure.

30. The system according to claim 29 characterized by further comprising detecting an acousto-EM energy signature of the structure in acoustic resonance which comprises means for detecting at least one manifested electromagnetic property of the targeted structure.

31. The system according to claim 30 characterized in that the structure is selected from the group consisting of inorganic and biologic.

32. The system according to claim 29 characterized in that the means for inducing acoustic resonance in the structure includes a signal generating device and at least one transducer.

33. The system according to claim 32 characterized in that placement of the transducer is selected from the group consisting of on the bottom of a vessel, as the walls of a vessel, in a vessel, intravascularly in the biologic structure, extracorporeally of the biologic structure, in a hand held probe, a piezoelectric sheet, in a remote control unit and in a scalpel tip.

34. A system for identifying a structure by determining an acoustic signature and/or acousto-EM signature of the structure characterized by comprising:

- 30 a) means for inducing acoustic resonance in the structure;
- b) means for detecting an acoustic and/or acousto-EM energy signature of the structure in acoustic resonance.

35. A system for inducing acoustic resonance in a biologic structure to affect functions characterized in that the system comprises:

- a) means for generating an acoustic signal;
- b) means for transmitting the acoustic signal to the biological structure; and
- c) means for controlling the power level of the acoustic signal to affect functions of the biologic structure.

36. The system according to claim 35 characterized by further comprising:

- a) means for generating an electromagnetic signal; and
- b) means for transmitting the electromagnetic signal to the biologic structure.

37. A system for determining induction of acoustic resonance in a structure characterized by the steps comprising:

- a) means for generating electromagnetic energy equivalent to an acousto-EM signature;
- b) means for transmitting the electromagnetic energy to the structure;
- c) means for receiving a signal from the structure after the electromagnetic energy has interacted with the structure; and
- d) means for determining induction of acoustic resonance in the structure.

38. A method for determining induction of acoustic resonance in a structure characterized by the steps comprising:

- a) irradiating the structure with electromagnetic energy equivalent to an acousto-EM signature;
- b) receiving a signal from the structure after the electromagnetic energy has interacted with the structure; and
- c) determining induction of acoustic resonance in the structure.

39. A method to affect the functioning of a biologic structure having a piezoelectric nature acting as a living transducer characterized by applying electromagnetic energy to the biologic structure with a piezoelectric nature, the electromagnetic energy having at least one frequency including the resonant frequency of the biologic structure to induce acoustic resonance within the living transducer, the energy being applied at a power output level sufficient to affect functioning of the biologic structure.